6-2012

A Web-Based Study of Self-Treatment of Opioid Withdrawal Symptoms with Loperamide

Raminta Daniulaityte
Wright State University - Main Campus, raminta.daniulaityte@wright.edu

Robert G. Carlson
Wright State University - Main Campus, robert.carlson@wright.edu

Russel S. Falck
Wright State University - Main Campus, russel.falck@wright.edu

Delroy H. Cameron
Wright State University - Main Campus, cameron.20@wright.edu

Sujan Udayanaga
Wright State University - Main Campus

See next page for additional authors

A Web-Based Study of Self-Treatment of Opioid Withdrawal Symptoms with Loperamide

Raminta Daniulaityte,[1] Robert Carlson,[1] Russel Falck,[1] Delroy Cameron,[2] Sujan Udayanga,[2] Lu Chen,[2] Amit Sheth[2]

[1]Center for Interventions, Treatment, and Addictions Research (CITAR), Department of Community Health, Boonshoft School of Medicine, Wright State University: http://med.wright.edu/citar

[2]Ohio Center of Excellence in Knowledge-Enabled Computing (Kno.e.sis), Wright State University: http://knoesis.org

Abstract

Aims: Many websites provide a medium for individuals to share their experiences and knowledge about different drugs. Such User-Generated Content (UGC) can be a rich data source to study emerging drug use practices and trends. The study aims to examine web-based reports of loperamide use practices among illicit opioid users. Loperamide, a piperidine derivative, is an opioid agonist approved for the control of diarrhea symptoms. Because of its general inability to cross the blood-brain barrier, loperamide is considered to have no abuse potential and is available without a prescription.

Methods: A website that allows for the free discussion of illicit drugs and is accessible for public viewing was selected for analysis. Web-forum posts were retrieved using Web Crawlers and retained in a local text corpus. All unique user names were anonymized. The corpus was queried to extract posts with a mention of loperamide and relevant brand/slang terms. Over 1200 posts were identified and entered into NVivo to assist with consistent application of codes related to the reasons, dosage, and effects of loperamide use.

Results: Since the first post in 2005, there has been a substantial rise in discussions related to its use by non-medical opioid users, especially in 2010-2011. Loperamide was primarily discussed as a remedy to alleviate a broad range of opiate withdrawal symptoms, and was sometimes referred to as "poor man's methadone." Typical doses ranged from 70 mg to 200 mg per day, much higher than an indicated daily dose of 16 mg.

Conclusions: This study suggests that loperamide is being used extra-medically by people who are involved with the abuse of opioids to control withdrawal symptoms. There is a growing demand among people who are opioid dependent for drugs to control withdrawal symptoms, and loperamide appears to fit that role. The study also highlights the potential of the Web as a "leading edge" data source in identifying emerging drug use practices.

Introduction

The World Wide Web has been identified as one of the "leading edge" data sources for detecting patterns and changes in drug trends. Many Web 2.0 empowered social platforms, including web forums and Twitter, provide venues for individuals to share their experiences, post questions, and offer comments about different drugs, and thus can be used as a very rich source of unfiltered and anonymous self-disclosures of drug use behaviors. The study builds on interdisciplinary collaboration between the researchers at the Center for Interventions, Treatment, and Addictions Research (CITAR), and the Ohio Center of Excellence in Knowledge-enabled Computing (Kno.e.sis). In 2011, the two centers initiated a study to develop automated data collection and analysis tools to process web-based data on knowledge, attitudes, and behaviors related to the illicit use of buprenorphine, OxyContin® and other pharmaceutical opioids. In the process of developing entity identification techniques to automate coding and analysis of web-forum data, the research team discovered extensive web-based discussions of extra-medical use of loperamide (e.g., Imodium®), a piperidine derivative and an opioid agonist approved by the U.S. Food and Drug Administration for the control of diarrhea symptoms. Because of its general inability to cross the blood-brain barrier, loperamide is considered to have no abuse potential and is available without a prescription. To date, little is known about the extra-medical use of loperamide among illicit opioid users. This content analysis study was designed to examine intentions of loperamide use as reflected in web-based discussions as well as reported dosage and side effects.

Funding: Financial support was provided by NIH/NIDA Grant No. R21 DA030571 (Daniulaityte, PI; Sheth, PI) and the Department of Community Health Grant, Boonshoft School of Medicine, Wright State University.
Acknowledgements: The authors would like to express their gratitude to research assistant Erica M. Morgan for her help with the study.
Conflict of Interest: All authors declare that there are no conflicts of interest.
Corresponding author: Raminta Daniulaityte, PhD, Center for Interventions, Treatment, and Addictions Research, Boonshoft School of Medicine, Wright State University, 110 Medical Science, 3640 Colonel Glenn Hwy. Dayton, OH 45435. Office: 937-775-2811; Fax: 937-775-2214
raminta.daniulaityte@wright.edu.

Methods

Data collection: A website that allows for the free discussion of illicit drugs and is accessible for public viewing was selected for the study of loperamide use. The website limits the number of active memberships at any given time period, but it has had over 2,500 unique members since its inception in 2004. The web-forum posts were retrieved using Web Crawlers and retained in a local text corpus. All unique user names were anonymized. The corpus was queried to extract posts with a mention of loperamide and relevant brand/slang terms ("entity spotting"). Novel application of computer science techniques allowed for automation and faster retrieval of relevant web posts. Over 1,290 posts, covering a time period between 2005 and 2011, were identified and entered into NVivo data base for manual coding.

IRB procedures: Because postings on the selected website are made anonymously and intended for public viewing, Wright State University's IRB considered the study to be exempt from the human subjects review.

Coding: A random sample of 258 (20%) posts was selected for content analysis. The study used Complementary Explorative Data Analysis (CEDA) framework, which integrates qualitative and quantitative methods in content analysis of media communications (Sudweeks and Simoff, 1999). First, using a qualitative approach and preliminary "open" coding of a subset of posts, a coding scheme was developed. Next, 258 posts were coded to identify the intent of loperamide use, information on reported dosage and side-effects. Qualitative and quantitative approaches were used to make sense of the coded data and to discover temporal patterns of identified codes and themes.

Coder Reliability Assessment. A formal reliability sub-sample consisted of 129 (10%) posts. First, codes related to the intent of loperamide use were reviewed, clarified and pre-tested by the research team. The reliability sub-sample was then independently coded by three coders (first and second authors and a research assistant). SPSS was used to calculate: 1) percentage agreement; and 2) Cohen's kappa, which takes into account chance correction when calculating inter-coder agreement. Kappa of 0.40-0.75 indicates acceptable and above 0.75 indicates excellent agreement (Neuendorf, 2009).

Results

The first post on loperamide use appeared in 2005, and in 2010-2011, there was a notable increase in discussions related to loperamide (Figure 1). Almost 70% of posts discussed loperamide as a remedy to self-treat opioid withdrawal symptoms. About 25% of the sample discussed issues related to loperamide's potential to cross blood-brain barrier to produce euphoric or analgesic effects. The remaining posts included a few mentions of its' use as indicated (i.e., control diarrhea) or its' purported efficacy to potentiate other opioids (Table 1). Coder reliability assessment indicates excellent agreement in relation to identifying intent of use (Table 2).

Content analysis indicates that withdrawal-related discussions of loperamide use increased over time, while those related to its' potential to cross blood-brain barrier and produce a "high" or analgesia remained stable (Figure 2). Further, loperamide use to get high was more commonly discussed in "theoretical" terms. The majority of such posts expressed skeptical or ambivalent views regarding its' potential to produce euphoria or analgesia (Table 1). For example, the following views were expressed by the web-forum participants:

Post A: **"F… taking diarrhea medicine to get high! If it was possible to get high off Imodium, it would be illegal like all the other good drugs. C'mon guys just go buy some real drugs and stop wasting your time. It ain't gonna work."**

Reply to post A: **"Man, don't be so negative. Are you going through wd [withdrawals]? Just because it's legal doesn't mean there's no potential… It doesn't hurt to try…."**

"I'm a little behind on things. Are there any studies showing that loperamide crosses the BBB [blood-brain barrier] in people or first-hand reports? If so, do you have any links? This was going on for a while…. but if I remember correctly, no one was successful. Thanks."

Figure 1. Loperamide Mentions in Web-Based Discussions Over Time

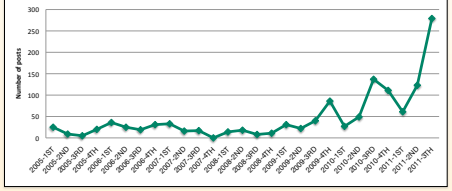


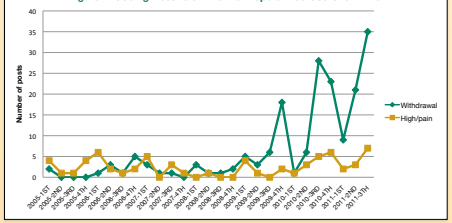
Table 1. Content Analysis of Loperamide Mentions in Web-Based Posts (N=258)

Intentions and reported efficacy of loperamide use		N	%
Self-treatment of withdrawal symptoms		177	69.0%
Positive views	(79%)		
Negative or ambivalent views	(21%)		
Use to get high or control pain (potential to cross blood-brain barrier)		65	25.0%
Positive views	(31%)		
Negative or ambivalent views	(69%)		
Use to potentiate other opioids		7	2.7%
Use as indicated		6	2.3%
Other or undetermined		30	12.0%

Table 2. Coder Reliability Assessment

Coder pair	Use to self-treat withdrawal symptoms		Potential to cross Blood Brain Barrier	
	Percent Agreement	Cohen's Kappa	Percent Agreement	Cohen's Kappa
A and B	87%	0.71	88%	0.63
A and C	95%	0.88	96%	0.86
C and B	91%	0.80	90%	0.68

Figure 2. Coding Results of Intent of Loperamide Use Over Time



In contrast, most of withdrawal-related mentions of loperamide were classified as endorsing its' efficacy to control a broad range of withdrawal symptoms (Table 1). The majority reported using "megadoses" of loperamide, averaging 70 mg per day, and in some cases ranging from 100 mg to 200 mg per day. These doses are significantly higher than an indicated dose of 16 mg per day. For example, web-forum participants shared the following opinions:

"If you take a shitload of loperamide, like 10-20 pills at once in withdrawal, you'll get relief from some of the physical symptoms. I'm not sure exactly how it works, but it's definitely MORE than just relieving the GI symptoms. I'm guessing if you just bombard your blood with it, SOME of it has to make it through? Not sure."

"Normally around 100 milligrams of loperamide will get me out of withdrawals."

"Loperamide alone is enough to keep me well without being miserable, IF I megadose."

"This loperamide has saved my life during w/ds [withdrawals].... and made me even more careless with my monthly meds."

"But I just wanted to tell you that loperamide WILL WORK. I take 105 mg of methadone/day, and recently have been running out early due to a renewed interest in IVing that shit. 200mg of lope 100 pills will make me almost 100 [percent] again. It brings the sickness down to the level of, say, a minor flu. Sleep returns, restlessness dissipates. Sometimes a mild opiation is felt."

"So you just stick with it. Don't go and score big with your next paycheck. Overcome the need to make everything numb. Learn to live with normality for a while. It'll all seem worthwhile soon enough. Go for a walk. Get out of the house. Go grab some loperamide from the store, the desperate junky's methadone."

The most commonly discussed side effects of loperamide use were constipation, dehydration and other types of gastrointestinal discomforts. Some also reported mild withdrawal symptoms from using loperamide for an extended period of time.

"Loperamide is good for a day or two but the problem is on loperamide I lose all desire to eat OR drink, or do anything, really."

"I used to sing the praises of loperamide....and still do, as a short term standby until you can score. Long term maintenance, it really wears you out. Starts to "feel" toxic though I doubt it actually is toxic... After a few days I would get severely dehydrated because it makes me lose all thirst … my stomach feels like I took a strong stimulant, eating is basically impossible, constipation is surprisingly not bad but still there…"

Conclusions

The study contains several limitations, including issues surrounding representativeness of the study results, lack of demographic and geographic information, and an inability to validate self-reported data. These limitations are mostly inherent to web-based studies and common in research with hidden and hard-to-reach populations. Nevertheless, the preliminary results of this web-based study identified new information about patterns of extra-medical drug use and self-treatment behaviors among illicit opioid users. Increasing web-based discussions about loperamide use of to self-treat withdrawal symptoms are reflective of the rising rates of opioid dependence disorders (McCabe et al., 2008; Substance Abuse and Mental Health Services Administration (SAMHSA), July 15, 2010). **They also indicate a growing demand among users for accessible remedies to assist in their self-treatment efforts.** The study highlights the importance of the web-based data in informing drug use epidemiology and an **urgent need to incorporate leading-edge information processing techniques to facilitate automatic or semi-automatic knowledge discovery**.

References

McCabe, S.E., Cranford, J.A., West, B.T., 2008. Trends in prescription drug abuse and dependence, co-occurrence with other substance use disorders, and treatment utilization: Results from two national surveys. Addict Behav. 33, 1297-1305.

Neuendorf, K.A., 2009. Reliability for Content Analysis. In: A.B. Jordan, D. Kunkel, J. Manganello, M. Fishbein (Eds.), Media Messages and Public Health : A Decisions Approach to Content Analysis Routledge, New York, pp. 67-87.

Substance Abuse and Mental Health Services Administration (SAMHSA), July 15, 2010. The TEDS Report: Substance Abuse Treatment Admissions Involving Abuse of Pain Relievers: 1998 and 2008. SAMHSA, Office of Applied Studies, Rockville, MD.

Sudweeks, F., Simoff, S.J., 1999. Complementary Explorative Data Analysis: The Reconciliation of Qualitative and Quantitative Principles. In: S. Jones (Ed.), Doing Internet Research: Critical Issues and Methods for Examining the Net Sage Publications, Thousand Oaks, CA, pp. 29-56.